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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,651	12/04/2003	Marc Robelet	2003-1731A	6169

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EXAMINER	
MCMAHON, MARGUERITE J	

ART UNIT	PAPER NUMBER
3747	

DATE MAILED: 10/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

NT

Office Action Summary	Application No.	Applicant(s)	
	10/726,651	ROBELET, MARC	
	Examiner	Art Unit	
	Marguerite J. McMahon	3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 17-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 17-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 17-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tausig et al (6,311,759) in view of Kemnitz (5,7778,533). Tausig et al teach that it is known to employ thixoforging to make articles which were previously formed by forging. Tausig et al describe the process of thixoforging an engine part such as a clutch hub, as an example. Tausig et al discuss the advantages that thixoforging has over conventional forging, and cites the following: "The forming stresses are up to four orders of magnitude lower in the semisolid state for thixotropic materials. It follows that more intricately shaped components can be formed in a single step to net or near net shape. In relation to conventional forging in particular, this also means that parts can be manufactured faster with a smaller number of processing steps and using smaller presses. Thixoforming also permits the shaping of otherwise unforgeable alloys." (See column 2, lines 5-13 of Tausig et al). "Another obviously important variable is the applied load necessary for the deforming (shaping) of the semisolid charge, and this may be several orders of magnitude less in thixoforming than is required in conventional forging" (See column 9, lines 12-17 of Tausig et al). Note that Tausig et al consider thixoforging to be a type of thixoforming.

Tausig et al show everything except utilizing the method of manufacture to form a piston, and some of the alloys claimed. Tausig et al show that it is old to employ stainless steel employing most of the elements claimed in claim 18 in similar percentages by weight (see Table 1), as well as an alloy based on Fe-Ni (as claimed in claim 24) or an alloy based on Ni-Col (as claimed in claim 25). See the end of Table 1. Tausig et al also maintain that a large number of metal alloys may be used in the process (see column 5, lines 1-2). Note that it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Kemnitz shows a one-piece steel piston formed by conventional forging. The problems solved by employing the thixoforging method are problems, which are confronted by any article of manufacture, such as a piston, which is made by conventional forging, and include requiring many steps, much force, and being limited as to choice of alloys. Thus, it would have been obvious to one having ordinary skill in the art to adapt the process of thixoforging to make a piston. Pistons formed by forging are conventional, as shown by Kemnitz, and the process of utilizing the process of thixoforging is a relatively new, but known alternative to forging. Thus, there is no inventive step involved in adapting this known process to make a piston, instead of employing the conventional process of forging to make the piston, since it solves some of the problems of conventional forging techniques, such as providing the ability to make the piston in a process that requires fewer steps, with less force, and thus can be made more quickly, and utilizing a larger variety of alloys. In addition, with respect to

claims 17-23, it would have been obvious to one having ordinary skill in the art to utilize the various alloys cited, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Response to Arguments

Applicant's arguments filed 8/10/06 have been fully considered but they are not persuasive.

Applicant points out that the examiner erred in not including all of the claims which were intended to be included in the rejection. This error has been corrected.

Applicant argues that Tausig et al does not relate to a thixoforging process, but a thixoforming process. In fact, Tausig et al describe both thixoforging and thixoforming, as Applicant defines them. Tausig et al describe thixoforging as a type of thixoforming. (see column 1, lines 45-53) as follows: "Thixoforming processes are further subdivided, if rather arbitrarily, into categories according to the conventional metal shaping technologies with which they are comparable in terms of general process and especially in terms of the actual machinery used for metal shaping. For example, thixocasting is based on liquid metal die casting technology, where as thixoforging is mare akin to solid metal forging, for example, in the use of vertical forging presses in shaping of the articles."

Tausig et al describe at column 8, lines 1-10: "A typical thixoforming cycle as practiced in the present 'open die' approach used in the following Examples and shown schematically in FIG. 5 consists of the following steps: (a) billet reheating, in which billet

10 is supplied to induction heating means 12 and **heated to a temperature between the solidus and liquidus temperature** to produce a thixotropic material. The thixotropic material is prefereably self-supporting (b) billet transfer to open dies, 14, 16 (c) forging stroke initiation and forming, and (d) removal of thixoformed component (not shown)." Although Tausig et al employ the word "thixoformed" the process described here is actually thixoforging, according to Applicant's definition of the word.

Applicant continues with additional arguments that the process shown in Tausig et al does not meet the claim language because the casting operation of Tausig is just above the liquidus temperature. However, as pointed out previously, Tausig et al show more than one process, and one of processes described by Tausig et al does employ heating the billet to a temperature between the solidus and liquidus temperature, as discussed in the previous paragraph.

Applicant also remarks that Tausig et al shows a solid fraction of 60 to 80%, whereas the present invention the solid fraction can go up to 90%. These ranges are close enough to preclude a patentable distinction, even if the range were included in the claims, which it is not.

Applicant includes some remarks about Kruse, which are not relevant as Kemnitz has been relied upon as the secondary reference in the present rejection.

Conclusion

Note the previously cited reference of Uggowitzer et al (6,547,896) which al recites at column 1, lines 10-20 the following: "The forming of metal alloys in the semi-solid state by means of thixocasting, thixoforging or thixopressure injection is gaining

significance as an alternative to the classic methods for producing formed pieces by means of casting, forging, and pressure injection. Thus, it is now possible to start with a material in the semi-liquid/semi-solid state...to manufacture cast or forged structural components that meet high quality demands. Particularly when it comes to the production of heavy-duty, lightweight metal formed pieces with a complex geometry, forming in the semi-solid state offers great economic advantages."

Note also the previously cited reference of Winter et al (4,457,355). Winter et al mention several materials as possibilities for the thixoforging pocess at column 11, lines 60-64, which recite: "The process and apparatus of this invention is applicable to the full range of materials as set forth in the prior art including but not limited to aluminum and its alloys, copper and its alloys and steel and its alloys."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marguerite J. McMahon whose telephone number is 571-272-4848. The examiner can normally be reached on Monday-Wednesday and Friday, 10am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Cronin can be reached on 571-272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MARGUERITE MCMAHON
PRIMARY EXAMINER